

What is claimed is:

1. A pneumatic tire for a motorcycle, comprising:

a tread which has a tread surface portion whose external surface curvature is comparatively large;

a pair of zigzag circumferential direction grooves for defining a central continuous circumferential rib which is positioned at a central portion in a tire axial direction of the tread and which extends in a zigzag state continuously in a tire circumferential direction, which extend in a zigzag stage along the tire circumferential direction; and

a plurality of pairs of inclining grooves, the inclining grooves being provided in the tire circumferential direction so as to be separated from each other at an interval at both sides in a tire transverse direction of the pair of zigzag circumferential direction grooves and being inclined with respect to the tire transverse direction such that each inclining groove extends from a tread end to a tire equatorial plane and terminates near the zigzag circumferential direction groove without contacting therewith, and an end portion of the inclining groove at a tire equatorial plane side is positioned further to a tire rotational direction side, than an end portion of the inclining groove at a tread end side, characterized in that

the inclining groove has a sharp inclining groove portion which is positioned at the tire equatorial plane side, and whose angle with respect to the tire circumferential direction is within a range of 0 to 20 degrees, and a loose inclining groove portion which is positioned at an external side in the tire transverse direction of the sharp inclining groove portion and whose angle with

respect to a tire circumferential direction is set larger than the angle of the sharp inclining groove portion,

a first longitudinal land portion having a substantially uniform width and a second longitudinal land portion having a width which gradually increases in a direction opposite to the tire rotational direction are alternately connected to each other and arranged in the tire circumferential direction between sides forming a zigzag shape of the zigzag circumferential direction groove, due to that a main portion of the sharp inclining groove portion at the tire equatorial plane side is positioned so as to face the side forming a zigzag shape of the zigzag circumferential direction groove, and portions of one sharp inclining groove portion and another sharp inclining groove portion of the inclining grooves adjacent to each other in the tire circumferential direction are made to overlap one another in the tire transverse direction.

2. The pneumatic tire for a motorcycle according to claim 1, characterized in that a tread crown radius at a tire equatorial plane portion as seen from a cross section along a tire rotational axis is equal to or less than 250 mm.

3. The pneumatic tire for a motorcycle according to claim 1 or 2, characterized in that an amplitude of the zigzag shape of the zigzag circumferential direction groove is within a range of 50 to 100 % of a road-contact width of a tire when the tire is attached to a standard rim, is filled with a standard air pressure, and receives a standard load in a state of a camber angle 0° , and a $1/2$ wavelength of the zigzag shape of the zigzag circumferential direction groove is within a range of 50 to 150% of a road-contact length of the

tire when the tire is attached to the standard rim, is filled with the standard air pressure, and receives the standard load in the state of the camber angle 0°.

4. The pneumatic tire for a motorcycle according to any one of claims 1 to 3, characterized in that

the sharp inclining groove portion forming the first longitudinal land portion inclines in the same direction as the side of the zigzag circumferential direction groove that faces the sharp inclining groove portion,

the sharp inclining groove portion forming the second longitudinal land portion inclines in an inverse direction to the side of the zigzag circumferential direction groove that faces the sharp inclining groove portion, and

a length in a tire circumferential direction of the second longitudinal land portion is shorter than that of the first longitudinal land portion.

5. The pneumatic tire for a motorcycle according to any one of claims 1 to 4, characterized in that end portions at a tire equatorial plane side of one inclining groove and the other inclining groove of the pair of the inclining grooves are positioned so as to have a phase difference in the tire circumferential direction with the tire equatorial plane interposed therebetween, and a phase difference of one pair of the inclining grooves and a phase difference of another pair of the inclining grooves adjacent to each other in the tire circumferential direction are set in directions opposite to each other.

6. The pneumatic tire for a motorcycle according to any one of claims 1 to 5, characterized in that one auxiliary inclining groove or two, which are

extended from the tread end to the tire equatorial plane side to terminate near a boundary between the tread central region and the tread side region, and which are substantially in parallel to the inclining grooves adjacent to each other in the tire circumferential direction, are provided between the inclining grooves in the tire circumferential direction.

7. The pneumatic tire for a motorcycle according to claim 6, characterized in that the auxiliary inclining grooves are positioned between the inclining grooves in the tire circumferential direction such that a groove distance between the grooves in the tire circumferential direction is kept constant.

8. The pneumatic tire for a motorcycle according to any one of claims 1 to 7, characterized in that a width of the central continuous circumferential rib is within a range of 20 to 50% of a road-contact width of a tire when the tire is attached to a standard rim, is filled with a standard air pressure, and receives a standard load in a state of a camber angle 0° .

9. The pneumatic tire for a motorcycle according to any one of claims 1 to 8, characterized in that an angle of the loose inclining groove portion to be measured from the tire rotational direction side to an external side in the tire axial direction with respect to the tire circumferential direction is within a range of 90 to 150 degrees.

10. The pneumatic tire for a motorcycle according to any one of claims 1 to 9, characterized in that minimum widths of the respective land portions defined

by grooves are substantially the same.

11. The pneumatic tire for a motorcycle according to any one of claims 1 to 10, characterized in that the sharp inclining groove portion and the loose inclining groove portion are smoothly connected to each other.

12. The pneumatic tire for a motorcycle according to any one of claims 1 to 11, characterized in that the entire length of the inclining groove forming the first longitudinal land portion is longer, by 5 to 20%, than that of the inclining groove forming the second longitudinal land portion.

13. The pneumatic tire for a motorcycle according to any one of claims 1 to 12, characterized in that characterized in that grooves except for the zigzag circumferential direction grooves have substantially the same width which is within a range of 60 to 80% of a groove width of the zigzag circumferential direction groove.

14. The pneumatic tire for a motorcycle according to any one of claims 1 to 13, characterized in that a circumferential direction pitch length between grooves at the tread end is within a range of 20 to 50% of a road-contact length of a tire when the tire is attached to a standard rim, is filled with a standard air pressure, and receives a standard load in a state of a camber angle 0°.

15. The pneumatic tire for a motorcycle according to any one of claims 1 to 14, characterized in that a width of an end portion in the tire rotational direction

side of the first longitudinal land portion and that of the second longitudinal land portion are within a range of 50 to 120% of a width of the central continuous circumferential rib.

16. The pneumatic tire for a motorcycle according to any one of claims 1 to 15, characterized in that an amplitude of the zigzag shape of the zigzag circumferential direction groove is within a range of 30 to 150 % of a width of the central continuous circumferential rib.

17. The pneumatic tire for a motorcycle according to any one of claims 1 to 16, characterized in that TH/SW is within a range of 0.25 to 0.45, given that a drop height measured in a tire radial direction between a tread maximum radial portion to a tire maximum width portion is TH , and a tire maximum width is SW , a road-contact length of a tire is within a range of 200 to 250% of a road-contact width when the tire is attached to a standard rim, is filled with a standard air pressure, and receives a standard load in a state of a camber angle 0° , and a road-contact shape is formed into a substantially ellipse configuration whose long axis is oriented in a tire circumferential direction.

18. The pneumatic tire for a motorcycle according to any one of claims 1 to 17, characterized in that a negative rate is within a range of 30 to 40% in a region within a range 50% of a tread periphery width with the tire equatorial plane of the tread as a center, and a negative rate is within a range of 20 to 30% in a region at an external side in the tire transverse direction, with respect to the region within a range of 50% of the tread periphery width with the tire

equatorial plane of the tread as a center.

19. The pneumatic tire for a motorcycle according to any one of claims 1 to 18, characterized in that an outer contour flatness in the tread central region is within a range of 0.4 to 0.7, and that in each of the tread side regions is within a range of 0.2 to 0.7, given that a tread crown radius/a tire maximum width is the outer contour flatness in the tread region within a range of 30 to 50 % of a tread periphery width with a tire equatorial plane as a center is a tread central region, and regions at an external side in the tire transverse direction of the tread central region are respectively tread side regions.

20. The pneumatic tire for a motorcycle according to any one of claims 1 to 19, characterized in that an angle of a groove wall at a groove stamping side of the inclining groove with respect to a normal line stood vertically on a tread surface is within a range of 0 to 45°, and an angle of a groove wall at a groove kick-out side thereof with respect to the normal line stood vertically on the road surface is within a range of 0 to 45°, and the angle of the groove wall at the groove stamping side is smaller than that at the groove kick-out side.

21. The pneumatic tire for a motorcycle according to any one of claims 1 to 20, characterized in that the respective groove depths are substantially the same in a region within a range of 50 % of a tread periphery width with a tire equatorial plane of the tread as a center.

22. The pneumatic tire for a motorcycle according to any one of claims 1 to

21, characterized in that the tire has a radial structure.